DOCUMENT RESUME

ED 449 168 TM 032 246

AUTHOR Franklin, Teresa
TITLE Predictors of Ohio K-4 Student Competencies on the National Educational Technology Standards.
PUB DATE 2000-04-00
NOTE 11p.; Paper presented at the Annual Meeting of the American Educational Research Association (New Orleans, LA, April 24-28, 2000).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Competence; Computer Literacy; *Computer Uses in Education; *Educational Technology; Elementary Education; Elementary School Students; *Professional Development; *Standards; State Programs
IDENTIFIERS *Access to Computers; Ohio; *Ohio SchoolNet

ABSTRACT

Beginning in 1994, the Ohio SchoolNet Program has worked to place computers in the Ohio Public Schools, and the SchoolNet Plus Initiative has provided at least one interactive computer workstation for every five children enrolled in grades K-4. This study examined (1) whether there were any relationships among teacher computer access, student computer access, years of teaching experience, and professional development concerning the use of technology; and (2) whether these characteristics can serve as predictors of student competence in the Ohio Public Schools as defined by the National Educational Technology Standards (International Society for Technology in Education, 1998). A survey was developed and sent to teachers in 108 public school districts in Ohio, and 762 surveys (72% return rate) were completed. The analysis of the data supports the SchoolNet Initiative in the placement of technology in the classroom. Survey responses indicate that the placement of computers has provided a leveling of the field in the development of technology competence. Low scores on two of the defined competencies suggest a lack of professional development in the integration of technology in the classroom. Study results indicate the need for professional development and time for the development of implementation strategies for the classroom. (SLD)

Reproductions supplied by EDRS are the best that can be made
from the original document.

Running head: Predictors of NETS Competencies

Predictors of Ohio K-4 Student Competencies on the National Educational Technology Standards

Teresa Franklin, Assistant Professor

Instructional Technology

Educational Studies

College of Education

Ohio University, Athens, OH

ED 449 168

TM032246

T. Franklin

BEST COPY AVAILABLE

Introduction

During the past four years, the International Society for Technology in Education (ISTE) has worked with educators, business leaders, government agencies and educational stakeholders in "PreK-12 education to develop national standards for the educational uses of technology that will facilitate school improvement in the United States (National Educational Technology Standards, 1998, p.3)." The resulting standards, the National Educational Technology Standards for Students, are part of a larger standards document called the National Educational Technology Standards (NETS).

Beginning in 1994, the Ohio SchoolNet Program has worked to place computers in the Ohio Public Schools. An estimated $95 million dollars has been spent to wire all K-12 classrooms for video, voice, and data transmission. In addition, the SchoolNet Plus Initiative had provided at least one interactive computer workstation for every five children enrolled in grades K-4 (National, 1996).

The implementation of national standards to evaluate levels of competency in learning has had a varied history in the United States. There has been much resistance as educators have worked to create a standard of competency for American youth in the areas of reading, math, and science. The global world in which students now compete tends to require the some level of competency be reached by high school graduation. Employers of our students have demanded that certain skills be in place so that they may avoid the expense of further training upon employment (Kelman, 1984). Colleges and businesses are now coping with the need for technology skills to meet the demands of the job market of the 21st century (ISTE, 1998). "National leaders, the U.S. Department of Education, and other federal agencies recognize the essential role of technology in the 21st century education (ISTE, 1998, Preface). President Clinton, Vice President Al Gore and a procession of state governors from both

political parties have endorsed technology as a necessary tool for education. At the 1997 national education summit in Palisades, New York, the governors and business leaders who attended made improving educational technology one of the two main goals for school change (Technology Counts: Taking Technology's Measure, *Education Week*, 1997).

Public schools are being asked to provide technology-related skills to students. This produces a strain on teachers both to teach in their content areas and to provide computer skills to students as part of the daily classroom experience. An added burden is the lack of professional development provided to teachers in the integrated use of computers in their content areas.

Problem Statement

After four years of implementation of the SchoolNet Program and SchoolNet Plus Initiative, the question still remains as to how competent the students are in the use of technology. Nor has an examination of the characteristics related to the development of these competencies by students been evaluated.

The purpose of this study is to determine if there are relationships among the following characteristics: teacher computer access, student computer access, years of teaching experience and professional development concerning the use of technology. Can these characteristics serve as predictors of student competency in K-4 in Ohio Public Schools as defined by the Technology Foundation Standards for Students as identified in the National Educational Technology Standards. The information gained serves as a baseline of data concerning Ohio K-4 student's technological competency.

Research Questions

The study seeks to answer the following research questions:

1. Do the combined characteristics of teacher computer access, student computer access, years of teaching experience, and professional development predict student competency on the Technology Foundation Standards for Students as defined in the National Educational Technology Standards (NETS) in grades K-4 in Ohio Public Schools?
2. What perceived barriers remain in place in Ohio Public Schools that inhibits technology competency in students?

The study is limited to the grades kindergarten through fourth grade in public schools in Ohio; therefore generalization beyond that population is limited. Teachers in all content areas were surveyed where possible. The National Educational Technology Standards have only been available since June of 1998. A pilot study was conducted to help identify terminology of concern and care was taken to provide explanations where the terminology was found to suspect.

Method

During the fall of 1998, a pilot survey was developed and administered to a random sample of schools to aid in the development of an instrument for examining the student competencies concerning the NETS standards. After several revisions and re-piloting, a final survey was developed which contained the NETS standards as well as demographic and classroom implementation questions. The population of this study consists of K-4 teachers in Ohio Public Schools. The sample consists of 108 (total of 612 in the state) public school districts in which K-4 teachers were surveyed concerning their perceptions of the level of competency their students hold when compared to the National Educational Technology Standards. In order to address the questions presented in the most representative means for

the state, the Ohio Department of Education was contacted and a striated random sample of the state's schools was developed. The striations took into account the socio-economic status of the school district, the designation of rural, urban/suburban or major city, the poverty level of the students in the district and the size of the school district. The random sample was given an alpha and number identity to help in determining the rate of return during data collection.

Surveys were sent out in early January of 1999. In hopes of improving the return rate, calls were made to each principal and/or superintendent in each school district to obtain permission to be surveyed and to give a short explanation concerning how to administer the survey. All districts agreed to be a part of the survey. Teachers were given an addressed and stamped envelope in which to return their survey. No identifying marks were used with which to identify the teacher's comments. A return rate of 72% (1080 surveys sent/762 returned) was achieved with the survey. It is felt that the high return rate of return can be attributed to the personal phone calls to the administrators, the confidentiality the teachers felt concerning their comments, and the topic is very timely in the state of Ohio as teachers are now expected to show proficiency in the use of technology.

The large number of surveys returned provided sufficient power and cross-validation to the researcher. A multiple regression analysis was performed on the data collected in the survey. This method of analysis was chosen because it could assist in determining which independent variable(s) might or might not be most effective in predicting the dependent variable. The dependent variable is Score that reports the teacher's perceptions of their students' technology competency. The independent variables are TCA (teacher computer access), SCA (student computer access), Y (years of teaching experience), and D (number of professional development course taken in technology). Correlations were examined between

the dependent and independent variables and between the independent variables. The literature review did not indicate an importance of individual variables and therefore all variables were entered into the analysis. The data was examined to determine if the assumptions of linearity, normality and homoscedasticity of the residuals and errors were met and if they met the criteria for multiple regression analysis. All assumptions were met. The ENTER method was used to evaluate predictability as there has been no previous research on these factors and the NETS standards.

Data was collected through the use of a survey that was piloted on two separate occasions before the final survey. A comment area was also placed at the end of the survey to allow for open-ended comments by participants. A striated random sample was generated using information from the Ohio Department of Education concerning the characteristics of the school districts in Ohio. A total of 1080 surveys were sent to 108 school districts in the [illegible] Public School system. Due to the large variety of size and structure of grades K through 4 in Ohio, it was determined that ten surveys would sent to each school. Instructions were given to randomly place two surveys in each grade K-4 teacher mailbox. The instructions were given verbally via the telephone to the school principal and again in writing to the school principal with the survey packet. A total of 762 surveys were returned (72% return rate). At least a 50% return rate was maintained for each of the schools surveyed.

Results

The analysis of the data supports the SchoolNet Initiative in the placement of technology in the classroom. The data indicates that this placement of computers has provided a "leveling of the field" in the development of technology competencies. No differences were found among the different striations of the sample. The regression equation

indicates that student computer access is the largest indicator of success on the NETS competencies and also supports the SchoolNet Initiative. In an examination of the competencies, it appears that the low scores on two of the competencies support the lack of professional development training in the integration of technology into the content areas. Students were unable to determine how they might use technology in their classwork. Two other competencies resulting in low scores referred to questions on the NETS which require that students use telecommunications and technology resources for problem solving, communication and illustration of ideas. The implementation of these activities in the classroom requires that a teacher have a more complete and detailed understanding of how problem solving and the use of technology can support each other. It would be expected that teachers engaged in these types of activities would require more than skill development from their professional development courses. One comment summarized the use of technology and the lack of competency on the part of the student when it stated "Technology integration will not be achieved in the schools until we are trained and have the time to practice it in our classrooms."

Conclusions

This study supports the following recommendations. 1) Professional development and time for the development of implementations strategies into the "real" classroom is needed if technology is to be seen as a viable part of the teaching and learning process. There is an apparent chasm between understanding technology and what it can provide for the classroom as part of the learning process. 2) Teacher education and professional development should work to help teachers identify the value in using technology as a support for important classroom activities such as interpretation of graphed data, searching databases for research,

spreadsheets for data collection and critical thinking skills development through Internet searching. These are all activities that support the Ohio Proficiency Exam. 3) Teacher education has yet to convince teachers that the time spent in learning how to integrate technology into the content areas can increase the achievement of students. Further study into achievement in technology enriched classrooms must be made and shared with administrators and educators. 4) Study must be made into the organization of schools and the development of professional development that will work within the school structure and allow for more time to develop integrated technology enriched lessons for use in the classroom. Professional development courses must be designed to encourage curriculum integration techniques.

Educational Importance of the Study

The results of this study provide baseline data for further evaluation of student competencies in the use of technology in Ohio Public Schools. This data provides the researcher and the governing bodies of the Ohio SchoolNet Initiative with an opportunity to see if the placement of technology in the K-4 classrooms will indeed increase the technology competencies of students as they move through grades K-4. The NETS provides a framework within which to evaluate these competencies. The results of this research support the old adage "practice makes perfect" as student computer access is the largest indicator of success on the NETS. This also supports the continued placement of technology in the classroom.

Finally, the comments obtained in the open-ended comment section suggest that continued study is needed on how to structure professional development and time for teachers to practice the implementation of technology into the curriculum. More than 90% of the teachers surveyed had taken professional development courses in the use of technology. Only

15% had taken professional development courses in which the integration of the technology into the everyday lessons of the classroom had been presented.

References

Kelman, P. (Summer, 1984). Computer literacy: a critical re-examination. Computers in the Schools, 1(2), 3-15.

National Education Technology Standards for Students. International Society for Technology in Education, (1998), Oregon: Eugene. [online] http://www.iste.org.

Teachers and Technology: Making the Connection. (1995). Office of Technology Assessment. Washington, DC: U.S. Government Printing Office. [On-line]. Available: http://www.educ.msu.edu/courses/CEP810/1OTA_ch1_Summary.html.

Technology Counts: Taking Technology's Measure, *Education Week*, 1997.